PROJECT REPORT
Tucker Latex Plant

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Bud

COMPARATIVE ELASTOMERIC COATING STUDY

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PLAINTIFF'S EXHIBIT
UC-1007

SUMMARY This initial study of our new latex for elastomeric coatings proves that UCAR Latex 123 has merit and does well against our work horse, UCAR Latex 163, and the competition, EC-1791 and EC-1895. UCAR Latex 123 excels in caustic resistance and elongation while equaling EC-1895 in adhesion to urethane foam and water resistance.

INTRODUCTION This project was undertaken to evaluate the new latex (UCAR Latex 123) developed for the elastomeric coating market against UCAR Latex 163 and Rohm & Haas' newly developed latexes (EC-1685 and EC-1895) for the same market. A secondary objective was for Steve Gray to learn about these products and how to test them.

DISCUSSION These four vehicles were substituted on an equal volume solids basis in a formulation developed for UCAR Latex 163. The pH of the two latexes from Rohm & Haas were slightly higher. The mastic prepared with EC-1791 only had a stormer viscosity of 80 KU's while the others were about 10 units higher. On heat aging for two weeks at 125°F, the UCAR Latex 123 and EC-1895 were stable, while UCAR Latex 163 thickened considerably and the EC-1791 skinned over so badly a viscosity could not be run. Interestingly, the EC-1791 and UCAR Latex 123 did not pass any freeze/thaw cycles, while UCAR Latex 163 and EC-1895 both passed 5 cycles.

An aluminum dish cracking test was run to check for shrinkage and cracking of extremely thick films and all four passed. A low temperature flexibility test was run following ASTM C-711 procedure except at -4°F instead of -10°F. The EC-1895 mastic had some slight cracking but they all passed the test. A Shore "A" hardness was run on these mastics and as expected the Rohm & Haas mastics were softer.

Tensile strength and elongation were attempted to be measured on these mastics following a procedure that calls for a dogbone shaped sample. With these small testing areas, our load

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cell on the Instron was not sensitive enough to be accurate. Steve decided to find a better way and he did. We are now using an ASTM D-2370 procedure which gives more consistent and accurate readings on the Instron. The UCAR Latex 123 mastic had just about double the elongation as the other three and had similar tensile strength as the two Rohm & Haas mastics. The UCAR Latex 163 had about three times the tensile strength as the other mastics and slightly less elongation than the two Rohm & Haas mastics. The actual data are summarized in Table I.

A large portion of this type product goes over rigid urethane foam and adhesion to this substrate is important. Rohm & Haas developed EC-1791 for adhesion to foam and we measured 2 pounds per inch force to peel at 180°. EC-1895 was surprisingly good at 1.2 pounds as was UCAR Latex 123 at 1.1 pounds. UCAR Latex 163 was low at .35 pounds.

Two water resistance type tests were run on these mastics. A water ponding test resulted in about the same amount of water being transmitted through the films for all but the EC-1895. The film thickness of the EC-1895, however, was only about half the thickness of the other three. A water absorption test was also run. In this case, UCAR Latex 163 and EC-1791 were similar and absorbed a little more water than UCAR Latex 123 or EC-1895.

Since these products are also used quite frequently on or over cementitious substrates which could be highly alkaline, a caustic absorption test was run. In this case, the UCAR Latex 163 mastic dissolved, and the EC-1791 and EC-1895 mastics increased their weight by 29% and 79% respectively while the UCAR Latex 123 mastic only increased 15%.

CONCLUSIONS The test results indicate that UCAR Latex 123 is a viable product for this market. It has good caustic resistance, good water resistance, comparably good adhesion to urethane foam, good low-temperature flexibility, good tensile strength, and extremely good elongation. The poor freeze/thaw resistance can be corrected by formulating.

Jim Salisbury
J. R. Salisbury

JRS:rs

Attachment: 1 Table

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TABLE I

ELASTOMERIC TEST RESULTS

	UL-163	UL-123	EC-1791	EC-1895
Initial pH	7.23	7.97	8.96	8.85
Initial Stormer Visc., KU	89	89	80	93
Stormer Visc., 2 Weeks at 125°F	140	99		103
Freeze/Thaw, Cycles Passed	5	0	0	5
Low Temperature Flexibility	Pass	Pass	Pass	Pass
Cracking	None	None	None	Slight
Adhesion Loss	None	None	None	None
Delamination	None	None	None	None
Separation	None	None	None	None
Tensile Strength, Dry, psi	129	40.5	35.1	51
Elongation, Dry, %	529	>1200	647	704
Aluminum Dish Cracking				
Overnight	None	None	None	None
1 Week	None	None	None	None
Shore "A" Hardness	52	50	38	38
180° Peel Adhesion, Dry Substrates Foam	0.38#	1.1#	2#	1.2#
Water Ponding, Thickness, In.	0.09	0.081	0.09	0.049
mg/24 Hours	127	210	180	293
Water Absorption, Weight Increase, %	16	10.6	16.1	16.9
Volume Increase, %	40	27.2	37.6	27.9
Caustic Absorption, Weight Increase, %	Dissolv.	15.1	28.9	78.7

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TABLE II

UCAR LATEX 163

FORMULATION WB-100

Ingredients	Pounds	Gallons
Water	150.0	18.01
CELLOSIZE HEC QP-4400H	4.0	0.34
Tamol 850	4.0	0.40
KTPP	1.0	0.13
Ethylene Glycol	20.0	2.16
Nopco NXZ	1.5	0.20
Ti-Pure R-960	62.0	1.92
Atomite	407.0	18.09
AZO-55	40.0	0.86
Nopcocide N-96	5.0	0.33
Letdown		
UCAR Latex 163	502.0	56.40
Texanol	6.0	0.76
Nopco NXZ	2.0	0.26
	1,204.5	99.86

PVC = 40%

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TABLE III

UCAR LATEX 123

FORMULATION WB-100

Ingredients	Pounds	Gallons
Water	150.0	18.01
CELLOSIZE HEC QP-4400H	4.0	0.34
Tamol 850	4.0	0.40
KTPP	1.0	0.13
Ethylene Glycol	20.0	2.16
Nopco NXZ	1.5	0.20
Ti-Pure R-960	62.0	1.92
Atomite	407.0	18.09
AZO-55	40.0	0.86
Nopcocide N-96	5.0	0.33
Letdown		
UCAR Latex 123	485.0	54.49
Texanol	6.0	0.76
Nopco NXZ	2.0	0.26
	1,187.5	97.95

PVC = 40.5%

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TABLE IV

RHOPLEX EC-1791

FORMULATION WB-100

Ingredients	Pounds	Gallons
Water	150.0	18.01
CELLOSIZE HEC QP-4400H	4.0	0.34
Tamol 850	4.0	0.40
KTPP	1.0	0.13
Ethylene Glycol	20.0	2.16
Nopco NXZ	1.5	0.20
Ti-Pure R-960	62.0	1.92
Atomite	407.0	18.09
AZO-55	40.0	0.86
Nopcocide N-96	5.0	0.33
Letdown		
Rhoplex EC-1791	529.0	59.77
Texanol	6.0	0.76
Nopco NXZ	2.0	0.26
	1,231.5	103.23

PVC = 40.5%

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TABLE V

RHOPLEX EC-1895

FORMULATION WB-100

Ingredients	Pounds	Gallons
Water	150.0	18.01
CELLOSIZE HEC QP-4400H	4.0	0.34
Tamol 850	4.0	0.40
KTPP	1.0	0.13
Ethylene Glycol	20.0	2.16
Nopco NXZ	1.5	0.20
Ti-Pure R-960	62.0	1.92
Atomite	407.0	18.09
AZO-55	40.0	0.86
Nopcocide N-96	5.0	0.33
Letdown		
Rhoplex EC-1895	477.3	53.93
Texanol	6.0	0.76
Nopco NXZ	2.0	0.26
	1,179.8	97.39

PVC = 40.5%

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